Joint Warfare System (JWARS)

Update to

DMSO Industry Days

June 4, 1999

Jim Metzger
JWARS Office

Web Site: http://www.dtic.mil/jwars/
e-mail: jwars@osd.pentagon.mil

Agenda

- Background
- Development Process
- Technical Overview
- Schedule

Background

Background

May 95 - Deputy Secretary of Defense initiated Joint Warfare System (JWARS) development as one component of Joint Analytic Model Improvement Program (JAMIP).

Sep 95 - May 97 - JWARS Office developed prototype to demonstrate feasibility and refine software development process .

Aug 98 - Joint Requirements Oversight Council (JROC) approved JWARS Operational Requirements Document (ORD).

JWARS Mission

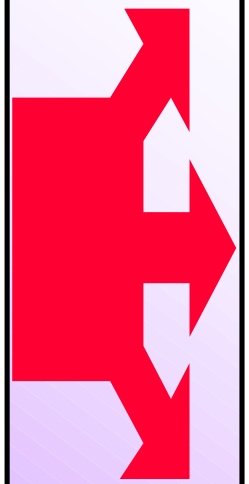
Mission: Develop a state-of-the-art, constructive simulation that will:

- **Provide a multi-sided and balanced representation of joint theater warfare**
- **Be able to assess current and future operational concepts to include JV 2010's:**

  Dominant Maneuver, Precision Engagement, Focused Logistics, and Full-Dimension Protection
- **Use C4 and ISR as the foundation for how objects perceive and interact with one another**

Users

- **Joint Staff**
- **Services**
- **CINCs**
- **OSD**
- **JTFs**
- **Other DoD org's**
- **Industry**



Applications

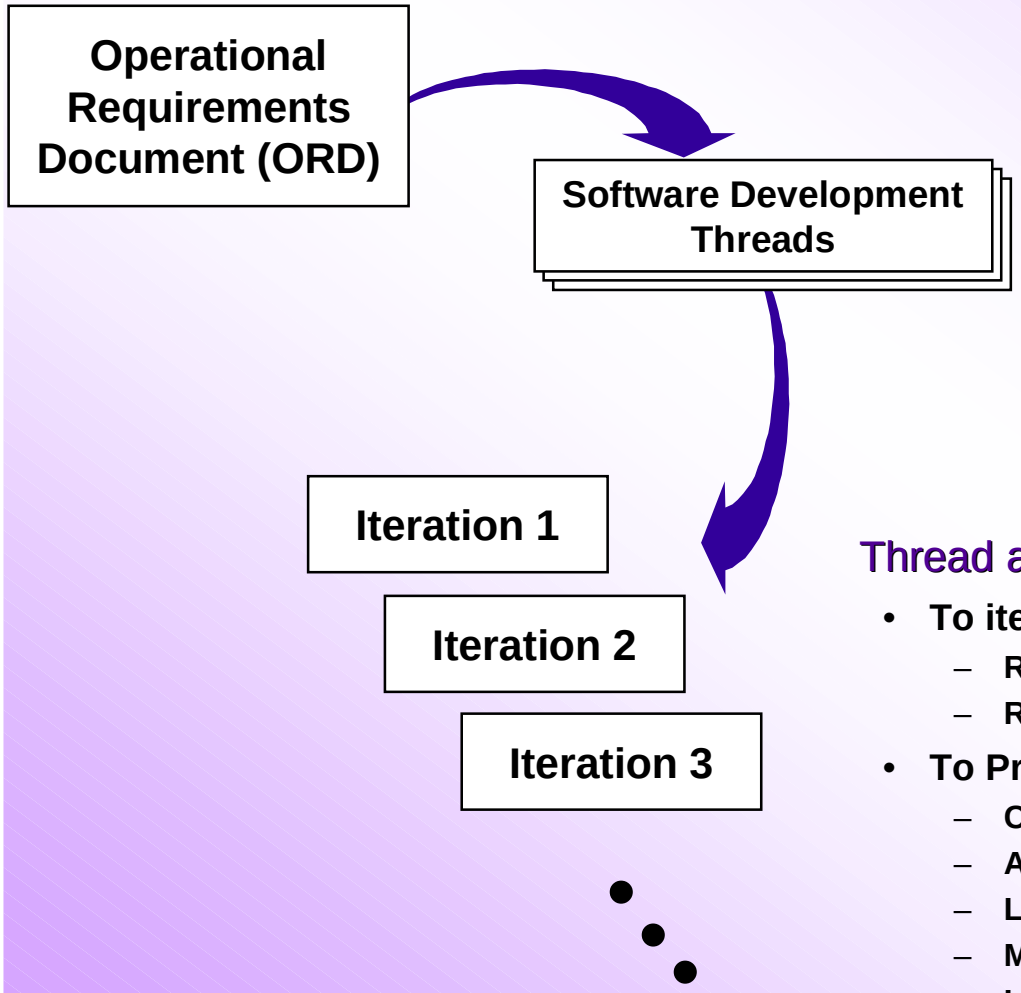
1. **Force assessment**
2. **Planning and execution**
   - **Deliberate planning**
   - **Crisis action planning**
3. **System effectiveness and trade off analysis**
4. **Concept and doctrine development and assessment**

Warfare Functionality - Summary

- **Release 1 (Limited IOC)**
  - **Include C4, ISR, logistics, and essential functionality in legacy simulations TACWAR and MIDAS.**
  - **Be capable of replacing TACWAR for force assessment application.**
- **Release 2 (Full IOC)**
  - **Provide balanced warfare representation, including C4, ISR, logistics.**
  - **Be capable of supporting the applications--**
    1. **Force assessment.**
    2. **Planning and execution.**
  - **Be capable of replacing TACWAR and MIDAS.**
- **Release 3 (FOC)**
  - **Provide balanced warfare representation, including C4, ISR, logistics.**
  - **Be capable of supporting the applications--**
    1. **Force assessment.**
    2. **Planning and execution.**
    3. **System effectiveness and trade-off analysis.**
    4. **Concept and doctrine development and assessment.**
  - **Be capable of replacing legacy simulations CEM, Thunder, ITEM, and SUMMITS.**

Software Development Process

Warfare Functionality Development Process
(slide 1 of 2)



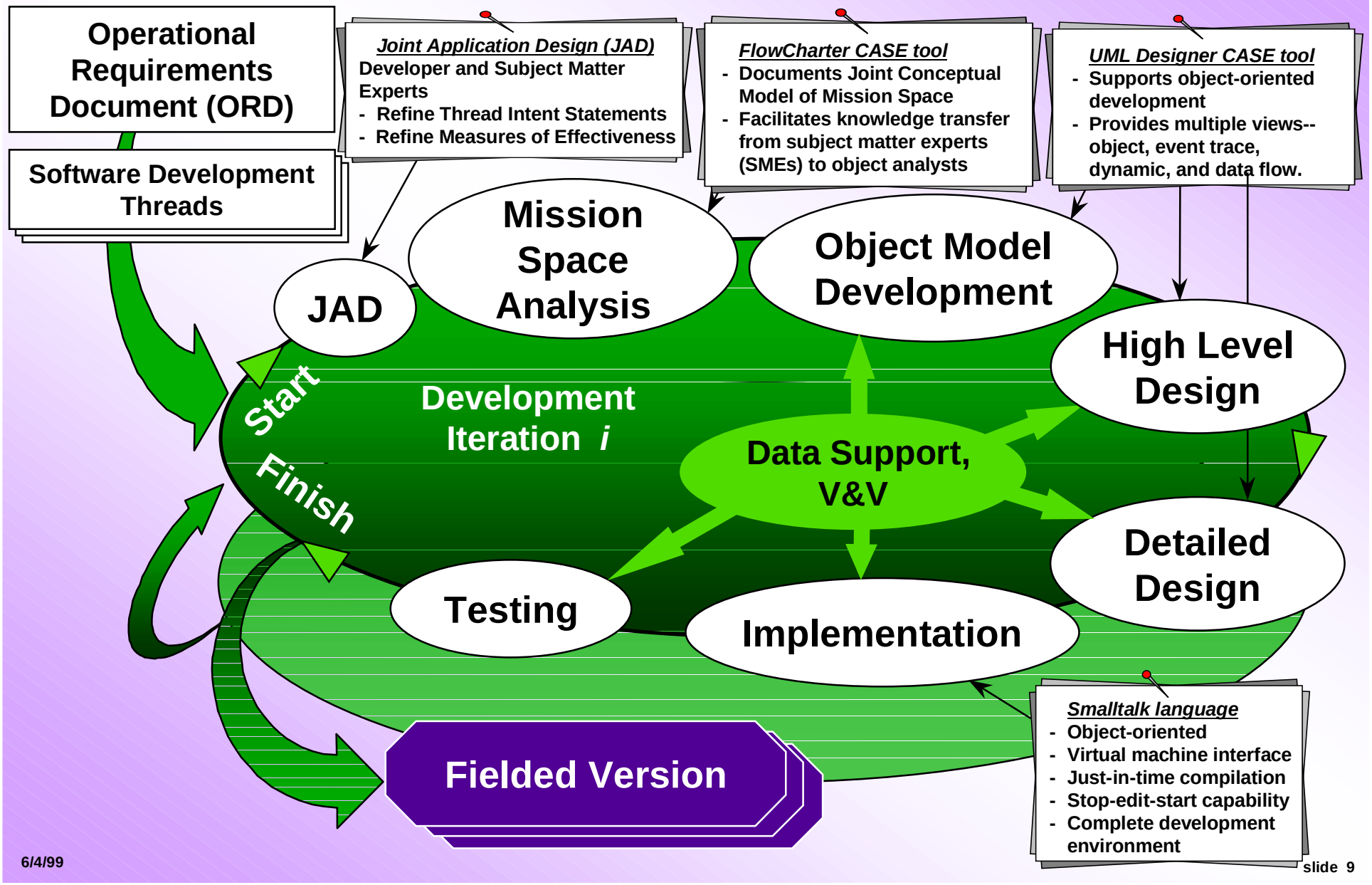
Threads

- Refine warfare functionality
- Functional area-related
- Resource-constrained
- ORD Release 1 threshold: *51 threads*
- ORD Release 2 threshold: *72½ threads*
- Example thread:
  "Conduct Defensive Land Operations"

Thread assignments

- To iterations
  - Release 1: 5 iterations
  - Release 2: 3 additional iterations
- To Problem Domain Integrated Product Teams (IPTs)
  - C4ISR
  - Air and Space
  - Land
  - Maritime
  - Logistics
- Generally 2 threads / IPT / iteration

Warfare Functionality Development Process
(slide 2 of 2)



Collaborative Development Process

- **Activities**
  - Requirements definition and refinement
  - Design and implementation
  - Data development
  - Verification and validation
  - Test and evaluation -- formal and informal
  - Training and installation
- **Participants**
  - JWARS Office
  - Joint Data Support
  - Joint Staff
  - OSD
  - Services
  - CINCs

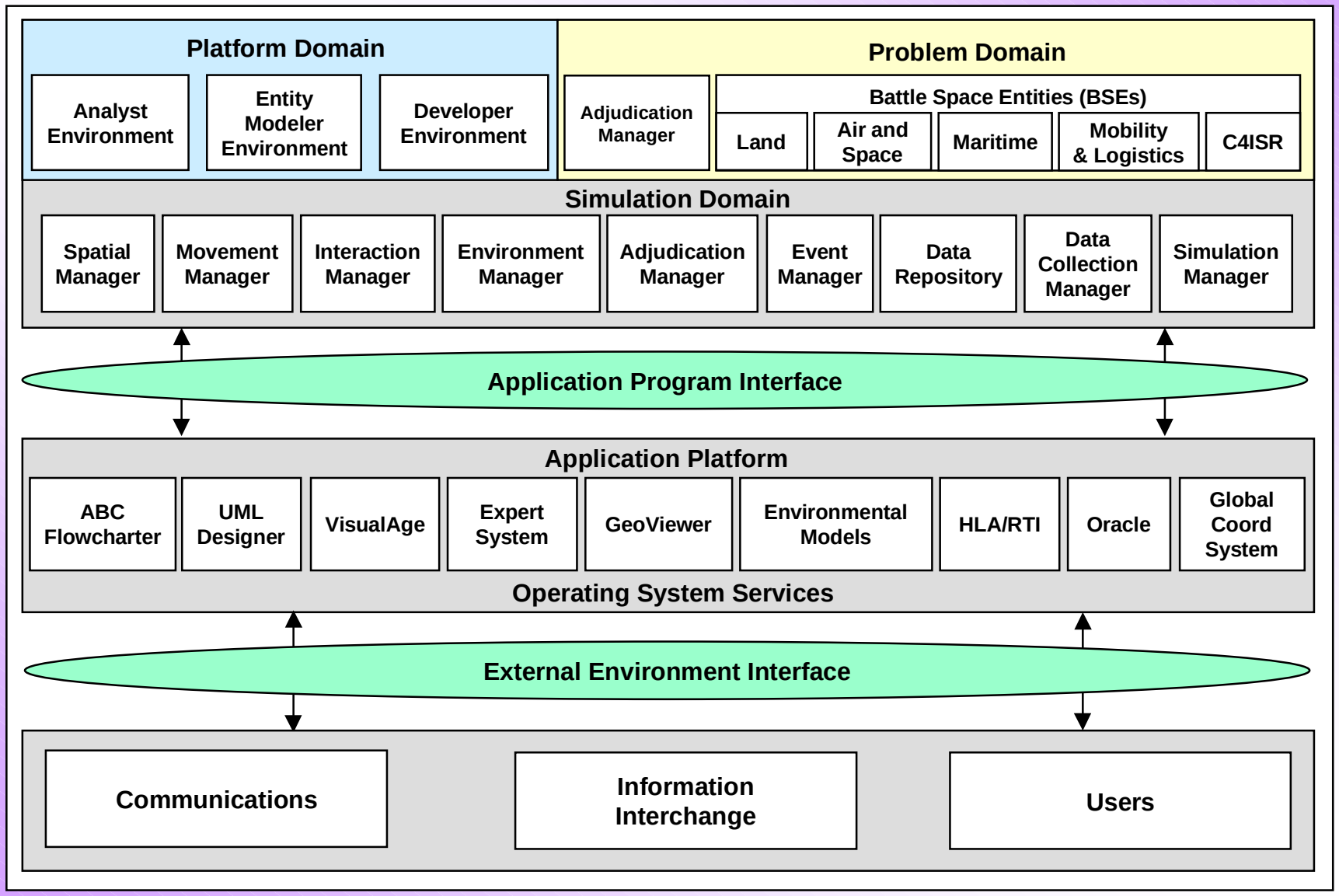
Coordination via Internet

- **JWARS Primary Web Site**
  - **Site address: http:/www.dtic.mil/jwars/**
  - **Access control: unlimited**
  - **Purpose: General information and publications**
  - **E-mail address for comments: jwars@osd.pentagon.mil**
- **JWARS Users' Group Web Site**
  - **Site address: https://ca.dtic.mil/j-u-g96/**
  - **Access control: user ID and password**
  - **Purposes**
    - **Coordination with users and subject matter experts**
    - **Help Desk support**
- **JWARS Working IPT Web Site**
  - **Site address: https://ca.dtic.mil/vvte.html**
  - **Access control: user ID and password**
  - **Purpose: Coordination with V&V and T&E oversight group**

Technical Overview

JWARS Architecture

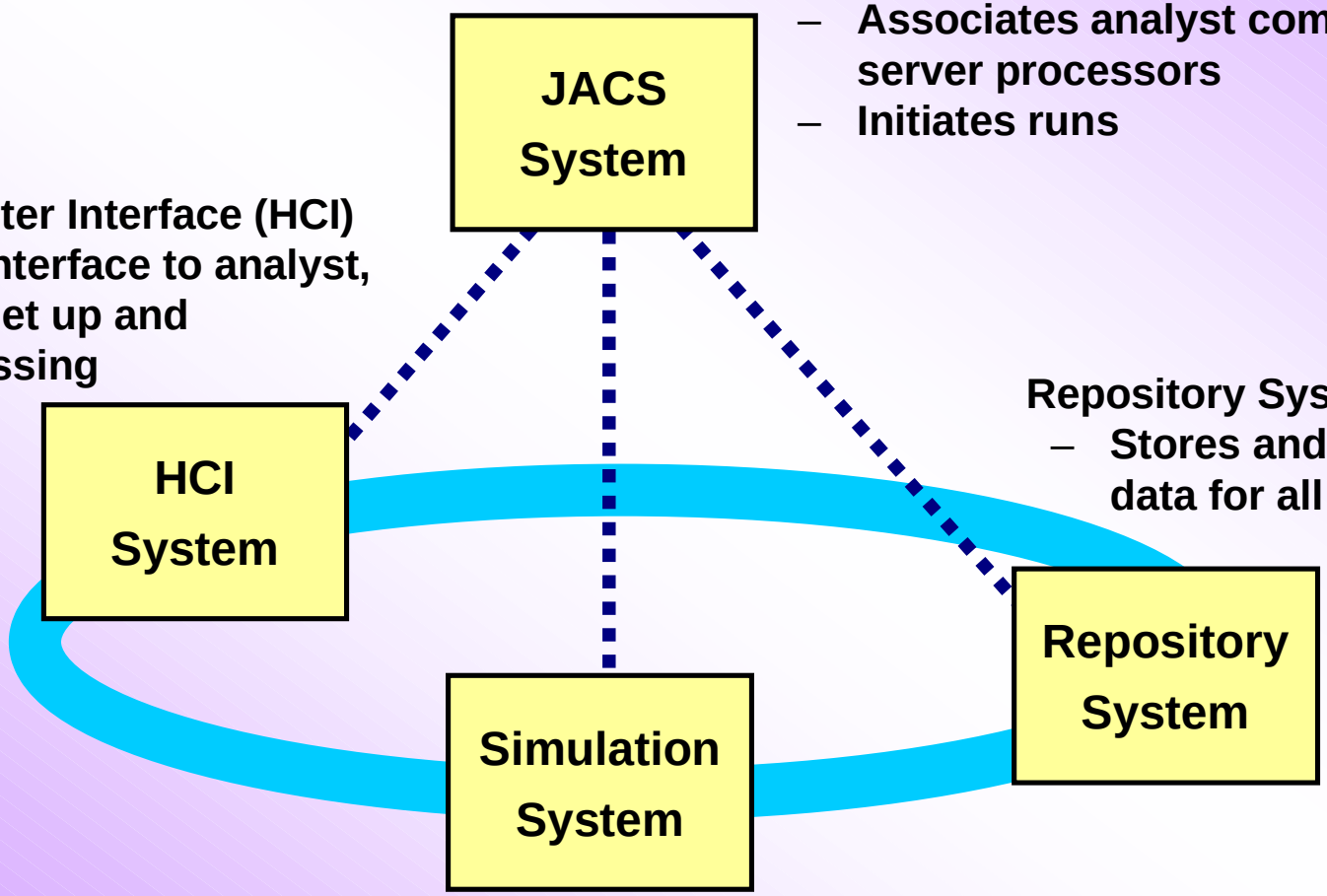
Joint Technical Architecture (JTA) View



Distributed System Design
(Process View)

JWARS Admin Control System (JACS)
- Associates analyst computer to server processors
- Initiates runs

Human Computer Interface (HCI)
- Provides interface to analyst, for study set up and postprocessing

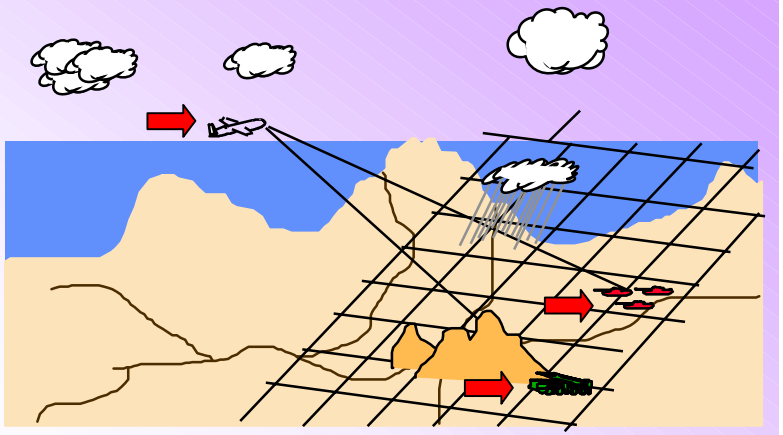


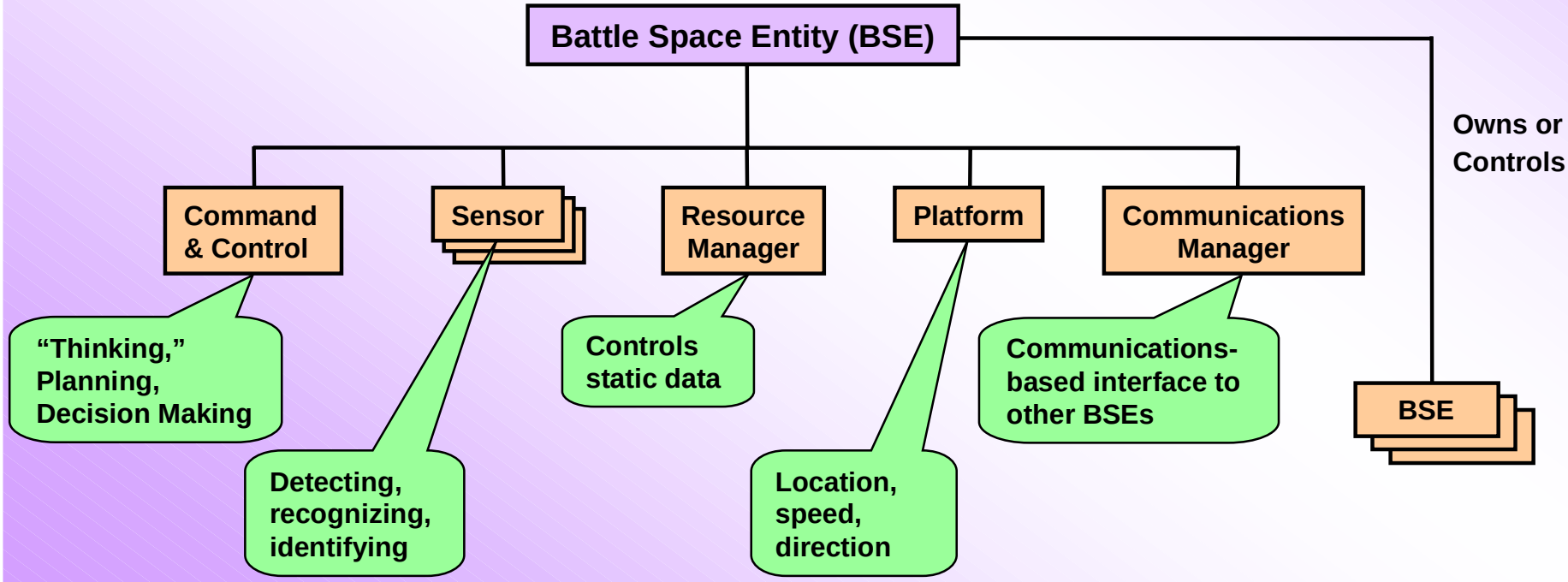
Repository System
- Stores and manages data for all runs

Performs simulation runs

Fundamental Problem Domain Component -- Battle Space Entity (BSE)

- **BSE -- friendly unit, enemy unit, or major system operating in the battle space**
- **Top-level decomposition**





Major BSE Types

Coalition Headquarters

Coalition Component Headquarters

Operational Headquarters
- Army Corps, Division, or Brigade
- USMC MEF Forward
- Air Expeditionary Force
- Air Flight Group
- Carrier Battle Group
- Surface Warfare Commander
- Surface Action Group

. . .

Mobility Forces
- Strategic Mobility Aircraft
- Strategic Mobility Ship

Operating Forces
- Land: Maneuver Battalion
- Air: Air Mission Element
- Space: Sensor Satellite
- Maritime: Ship, Submarine

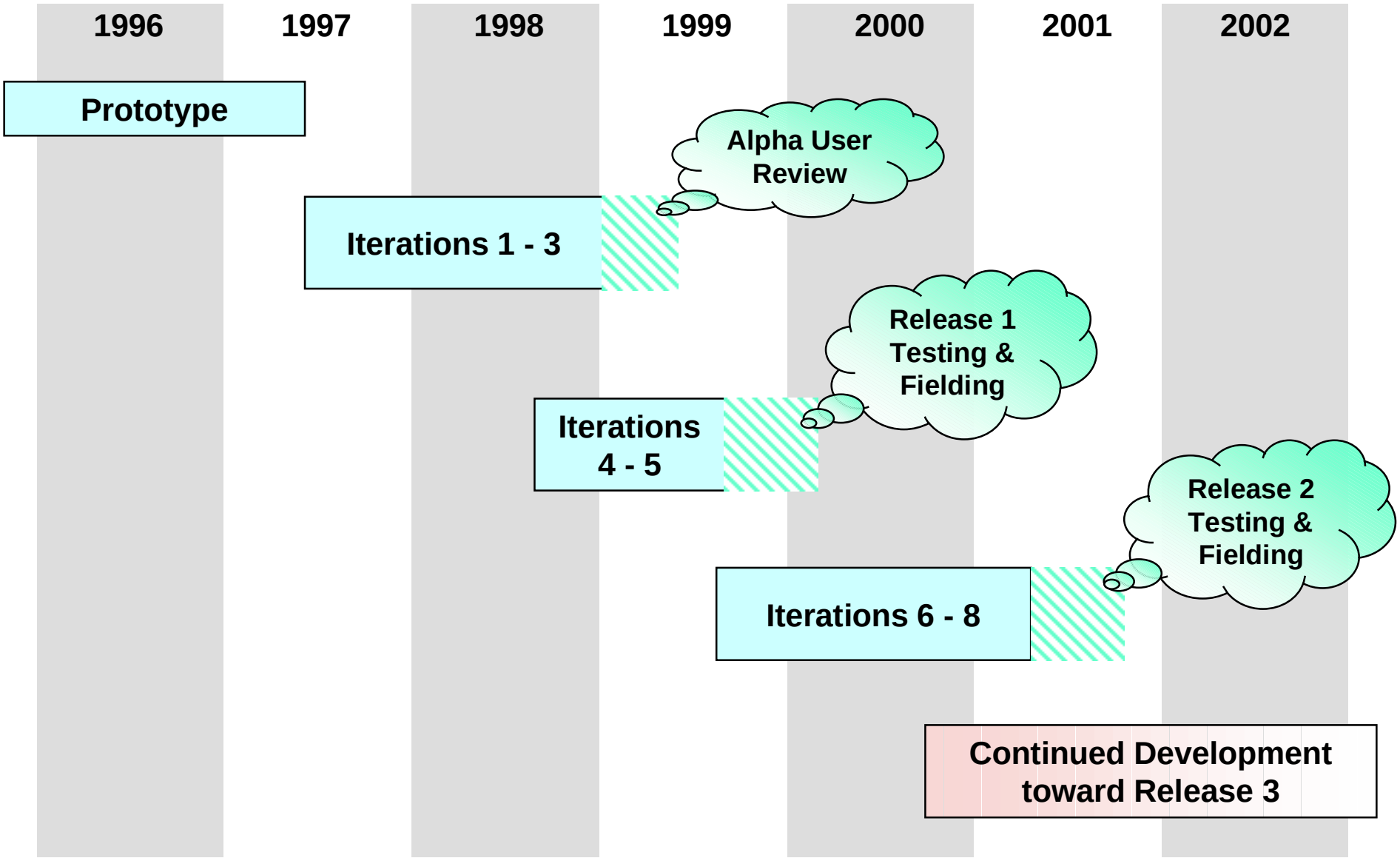
Support Forces
- Ground Combat Support and Combat Service Support Organization
- Airbase Support Organization

Stationary Entities
- Air Installation
- Seaport Installation
- Depot

. . .

Schedule

Schedule


1996
1997
1998
1999
2000
2001
2002
Prototype
Alpha User Review
Iterations 1 - 3
Release 1 Testing & Fielding
Iterations 4 - 5
Release 2 Testing & Fielding
Iterations 6 - 8
Continued Development toward Release 3

JWARS Release 1 (Limited IOC)
(55 Threads)

Warfare functionality

- **Strategic Logistics -- MIDAS(-)**
  - **Strategic flow from POE to POD**
  - **Strategic network**
  - **Simplified APOD and SPOD representations**
- **Theater Logistics -- Links strategic logistics to theater operations**
  - **Detailed theater network**
  - **Detailed logistics distribution**
- **Perception -- ISR**
  - **Provide intelligence information**
  - **Assess operational situation**
- **Operations -- Core TACWAR**
  - **Air, land, and sea operations (-)**
  - **Chemical defensive operations**
  - **Naval blockade**
  - **Air, land, and sea C4**
  - **Detailed Air Tasking Order (ATO)**
  - **Forcible entry operations (air, land, sea)**
  - **Theater Missile Defense**

JWARS Release 2 (Full IOC)
(72½ Threads *)

Warfare functionality (expressed as enhancements to 55 threads)

- **Strategic Logistics -- MIDAS(+)**
  - **Improved APOD and SPOD representations**
  - **Logistics C2**
- **Theater Logistics -- Links strategic logistics to theater operations**
  - **Restore unit combat capability**
  - **Allocate sustainment stocks**
  - **Operational service support**
  - **Intratheater aerial refueling**
- **Perception -- ISR**
  - **Completed at 55 threads**
- **Operations -- TACWAR(+)**
  - **Operational mobility/counter mobility -- land and sea**
  - **Integrated aerospace defense**
  - **Raids -- land-based and amphibious**
  - **Effects of attacks on strategic targets**
  - **Electronic attack**

* **Release 2 Threshold in ORD**

Release 1 Test and Evaluation

Objective

- **Ensure that ORD requirements are satisfied**

Process

- **Beta testing by user test sites, followed by ...**
- **Operational testing by user test sites, overseen by Services' Operational Test Agencies (Army lead)**

Participating user sites

ODPA&E (SAC)	**JS (J-8)**	**USAF (AFSAA)**	**USA (CAA)**
USN (N81)	**USMC (MCCDC)**	**USCENTCOM**	**USSOCOM**
USTRANSCOM	**USPACOM**	**USFK**	

Schedule

- **September 1999 - March 2000**

Summary

- **Development process is effective.**
- **Major contributions are being made by users and subject matter experts.**
- **Release 1 will begin test and evaluation in September 1999.**